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United States Patent [19]**Schneider**[11] **Patent Number:** **5,668,777**[45] **Date of Patent:** **Sep. 16, 1997**[54] **TORPEDO SIGNAL PROCESSOR**[75] **Inventor:** **Walter T. Schneider, Portsmouth, R.I.**[73] **Assignee:** **The United States of America as represented by the Secretary of the Navy, Washington, D.C.**[21] **Appl. No.:** **687,064**[22] **Filed:** **Jul. 8, 1996**[51] **Int. Cl.⁶** **G01J 15/66; F42B 19/00**[52] **U.S. Cl.** **367/96; 367/103; 367/135; 114/20.1**[58] **Field of Search** **367/96, 103, 105, 367/119, 122, 87, 135; 114/20.1, 21.3, 23; 364/423, 462, 516**[56] **References Cited****U.S. PATENT DOCUMENTS**

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An integrated torpedo sonar signal processor having an integrated analog-to-digital conversion component is provided. The torpedo sonar signal processor has four groups of low-pass filtered analog-to-digital converters, each group containing thirteen converters. The output of a group (thirteen converters) is a serial data signal which is outputted to a field programmable gate array which, in turn, converts the combined signal to parallel data word. The parallel data word is outputted to a first digital signal processor which in turn outputs to a second dual-port digital signal processor, the processor providing prefiltering and space-time processing. The output signal is then sent to a beamformer dual-port digital signal processor which has an attached external memory. The beamformer signal is then outputted to a signal processor component containing four dual-port digital signal processors and a common external memory. The entire torpedo sonar signal processor is controlled by a network controller which sequences the program downloads and system initialization. The network controller also provides a link to the torpedo's control processor over a field programmable gate array-based interface.

12 Claims, 6 Drawing Sheets